

## Useful Formulas

$$\bar{y} = \frac{1}{n} \sum_{i=1}^n y_i \quad s = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (y_i - \bar{y})^2} \quad r = \frac{1}{n-1} \sum_{i=1}^n \left( \frac{x_i - \bar{x}}{s_x} \right) \left( \frac{y_i - \bar{y}}{s_y} \right)$$

$$\hat{y} = b_0 + b_1 x \quad b_1 = r \frac{s_y}{s_x} \quad b_0 = \bar{y} - b_1 \bar{x}$$

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B) \quad P(A \text{ and } B) = P(A)P(B|A)$$

$$P(B|A) = \frac{P(A \text{ and } B)}{P(A)} \quad P(A) = P(B)P(A|B) + P(B^c)P(A|B^c)$$

$$P(B|A) = \frac{P(B)P(A|B)}{P(B)P(A|B) + P(B^c)P(A|B^c)}$$